



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/790,598

03/01/2004

John Frederick Knifton

TH1615 02 (US)

9154

23632 7590 06/19/2008  
SHELL OIL COMPANY  
P O BOX 2463  
HOUSTON, TX 772522463

EXAMINER

CORNO JR, JAMES A

ART UNIT

PAPER NUMBER

4162

MAIL DATE

DELIVERY MODE

06/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/790,598	<b>Applicant(s)</b> KNIFTON ET AL.	
	<b>Examiner</b> JAMES CORNO	<b>Art Unit</b> 4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17, 21-26, 28-42 and 45-48 is/are rejected.
- 7) ☒ Claim(s) 18-20, 27, and 43-44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/16/2006</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 6-8, and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the cobalt salt" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "the iron compound" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation "the iron salt" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 8 recites the limitation "the iron compound" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim 42 recites the limitation "the the iron compound" [sic] in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.

### ***Double Patenting***

Applicant is advised that should claims 4 and 5 be found allowable, claims 40 and 41 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Soled et al. (U.S. Patent No. 4,518,707). Soled teaches a catalyst composition comprising ferric nitrate and cobalt nitrate (example 1).

Claims 1, 4-5, 8, 35-37, 40-42, and 45-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Isogai et al. (U.S. Patent No. 4,650,911). Isogai teaches a catalyst with iron and cobalt compounds, in which the iron compound may be iron pentacarbonate and the cobalt compound may be dicobalt octacarbonate (Table 1).

Art Unit: 4162

Regarding claims 35-37, Isogai teaches a Fe:Co molar ratio of 1:2, which falls within the claimed range of "1:1 to 1:2."

Regarding claims 45-46, the claimed IR bands are understood be natural consequences of using the claimed carbonyl compounds.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 9, 12-13, 16-17, 22-26, 28, 33-34, and 38-39 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yoo (U.S. Patent No. 3,917,737). Yoo teaches a catalyst composition comprising Co, Fe, or Ni compound, or any combination thereof (claim 1) with a ligand (claim 3). The combination of Co and Fe is therefore anticipated as one of only four possible combinations.

Regarding claims 9, 12-13, and 21, Yoo teaches the use of 2,2'-dipyridil as a ligand (Example XXX, run C).

Regarding claims 16-17, Yoo teaches the use of pyridine as a ligand (col. 4, line 38).

Regarding claims 22-26, 28, and 38-39, Yoo teaches the use of bis(diphenylphosphino)ethane as a ligand (Example XXVI).

Regarding claims 33-34, Yoo teaches typical metal:ligand ratios of 1:1 (Examples XXVII and XXXIII). Catalysts with a 1:1 ratio of Fe:Co would therefore have a typical Fe:ligand ratio of 1:2, which falls within the claimed range of "2:1 to 1:2."

Alternatively, while Yoo does not give a specific example where Co and Fe are used together, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Co and Fe together as Yoo clearly teaches a very limited grouping for selection and teaches that combinations of these elements is contemplated; therefore one can readily envision a combination of Co and Fe.

Claims 1, 9-17, and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al. (U.S. Patent No. 4,661,623). Chang teaches a catalyst composition of two transition metals (col. 6, line 62 - col. 7, line 3) as taught by Gladfelter et al. ("Mixed Metal Clusters," *Advances in Organometallic Chemistry* v. 18, p. 207-273, 1980), of which iron/cobalt combinations are the most prominent examples.

Regarding claims 9-11, Chang teaches that the metals may be ligated by pyrazine (col. 3, line 59).

Regarding claims 12-13, Chang teaches that the metals may be ligated by phenanthroline (col. 3, lines 57-58).

Regarding claims 14-15, Chang teaches that the metals may be ligated by terpyridine (col. 3, line 58).

Regarding claims 16-17, Chang teaches that the metals may be ligated by pyridine (col. 3, line 28).

Regarding claim 48, Chang teaches that the metals may be ligated by ortho-benzoquinonediimine (col. 3, line 55), which is an aliphatic diimine.

Claims 1, 29-30, and 38-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Chu et al. (U.S. Patent No. 6,245,707). Chu teaches a transition metal catalyst with iron and cobalt with tetraphenylporphyrin ligands (example 2).

Claims 1, 29, 32, and 38-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirai et al. (JP 59138066 A). Hirai teaches a catalyst comprising iron and cobalt phthalocyanine (Table 1).

Claims 1 and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Lyons et al. (U.S. Patent No. 5,672,778). Lyons teaches a catalyst composition which may comprise both iron and cobalt compounds (col. 5, lines 51-54).

Regarding claims 29-31, Lyons teaches that the iron may be ligated with octaethylporphyrin (Example 2)

Regarding claim 32, Lyons teaches that the iron may be ligated with phthalocyanine (col. 5, line 53).

***Allowable Subject Matter***

Claims 18-20, 27, and 43-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: Chang is considered the closest prior art for claims 18-20 because it teaches a catalyst composition of iron and cobalt with pyridine ligands, but it does not specifically teach the claimed ligands, including 2,6-pyridil-diimines and homologues of 3-hydroxypyridine and quinoline.

Yoo is considered the closest prior art for claim 27 because it teaches a catalyst composition of iron and cobalt with diphosphine ligands of the form RRP-Q-PR'R', but it does not teach that the residues should form phosphacycloalkanes.

Lyons is considered the closest prior art for claims 43-44 because it teaches a catalyst composition of iron and cobalt with octaethylporphorine ligands, but it does not teach that the cobalt should be present in the form of dicobalt octacarbonyl with iron acetate octaethylporphorine.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES CORNO whose telephone number is (571)270-5829. The examiner can normally be reached on Monday-Thursday 9:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAMES CORNO/  
Examiner, Art Unit 4162

/Jennifer McNeil/

Supervisory Patent Examiner, Art Unit 4162